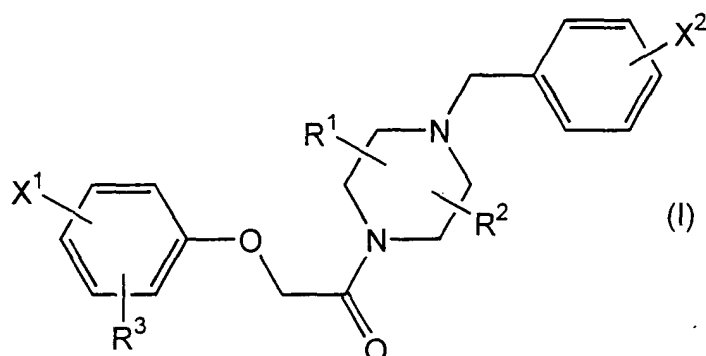


What is claimed is:

1. A compound of formula (I):



wherein:

$X^1$  and  $X^2$  are each independently halo;

$R^1$  and  $R^2$  are each independently hydrogen or alkyl; and

$R^3$  is hydrogen, amino, monoalkylamino, dialkylamino, monoaralkylamino,

alkylcarbonylamino, alkenylcarbonylamino, haloalkylcarbonylamino,

arylcarbonylamino, alkoxyalkylcarbonylamino, alkoxycarbonylalkylcarbonylamino,

glycinamido, monoalkylglycinamido, arylcarbonylglycinamido,

aminocarbonylglycinamido, (aminocarbonyl)(alkyl)glycinamido,

(alkoxyalkylcarbonyl)glycinamido, ureido, monoalkylureido, monoarylureido,

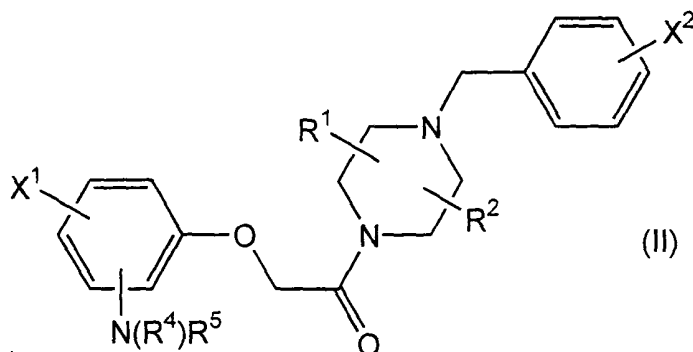
monoaralkylureido, or alaninamido;

and wherein either one of  $X^1$  or  $X^2$  is selected from the group of  $^{123}\text{I}$ ,  $^{125}\text{I}$ ,  $^{128}\text{I}$ ,  $^{131}\text{I}$ ,  $^{75}\text{Br}$ ,

$^{76}\text{Br}$ ,  $^{80}\text{Br}$  and  $^{18}\text{F}$ ; or wherein one of the carbon atoms in the compound is  $^{11}\text{C}$ ;

or a pharmaceutically acceptable salt thereof.

2. A compound of formula (II):



wherein

$X^1$  and  $X^2$  are each independently halo;

$R^1$  and  $R^2$  are each independently hydrogen or alkyl; and

$R^4$  is hydrogen; and

$R^5$  comprises a chelator capable of binding a radioactive metal atom chosen from the group of  $^{99m}\text{Tc}$ ,  $^{186}\text{Re}$  and  $^{188}\text{Re}$ ;

or as a complex with  $^{99m}\text{Tc}$ ,  $^{186}\text{Re}$  and  $^{188}\text{Re}$ ;

or a pharmaceutically acceptable salt thereof.

3. A compound according to claim 1, wherein said compound binds to chemokine receptor CCR1 and passes the blood-brain barrier.

4. A compound according to claim 2, wherein said compound binds to chemokine receptor CCR1 and passes the blood-brain barrier.

5. A compound according to claim 1, wherein  $R^1$  is methyl at the 2-position of the piperazinyl radical and  $R^2$  is methyl at the 5-position of the piperazinyl radical.

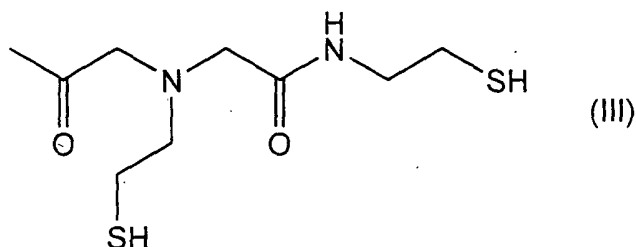
6. A compound according to claim 2, wherein  $R^1$  is methyl at the 2-position of the piperazinyl radical and  $R^2$  is methyl at the 5-position of the piperazinyl radical.

7. A compound according to claim 1, wherein  $R^1$  is methyl at the 2-position of the piperazinyl radical and  $R^2$  is hydrogen.

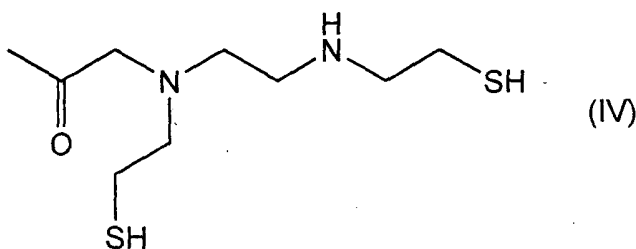
8. A compound according to claim 2, wherein R<sup>1</sup> is methyl at the 2-position of the piperazinyl radical and R<sup>2</sup> is hydrogen.

9. A compound of claim 1 wherein X<sup>1</sup> is chloro at the 4-position of the phenyl radical and X<sup>2</sup> is a <sup>18</sup>F atom at the 4-position of the phenyl radical.

10. A compound of claim 2, wherein R<sup>5</sup> comprises a chelator structure of formula (III):



11. A compound of claim 2, wherein R<sup>5</sup> comprises a chelator structure of formula (IV):

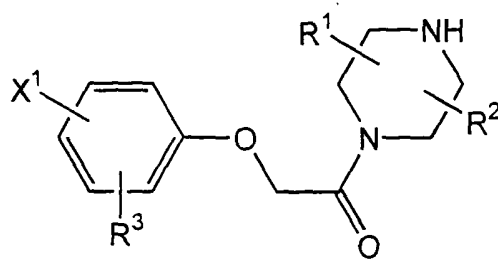


12. A compound of claim 10, wherein R<sup>5</sup> further comprises a linker moiety comprising an alkyl radical having one to ten carbon atoms, wherein the alkyl radical optionally contains one to ten -C(O)-groups, one to ten -C(O)N(R)- groups, one to ten -N(R)C(O)- groups, one to ten -N(R)- groups, one to ten -N(R)<sub>2</sub> groups, one to ten hydroxy groups, one to ten -C(O)OR- groups, one to ten oxygen atoms, one to ten sulfur atoms, one to ten nitrogen atoms, one to ten halogen atoms, one to ten aryl groups, and one to ten saturated or unsaturated heterocyclic rings wherein R is hydrogen or alkyl.

13. A compound of claim 11, wherein R<sup>5</sup> further comprises a linker moiety comprising an alkyl radical having one to ten carbon atoms, wherein the alkyl radical

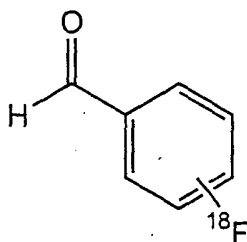
optionally contains one to ten -C(O)-groups, one to ten -C(O)N(R)- groups, one to ten -N(R)C(O)- groups, one to ten -N(R)- groups, one to ten -N(R)<sub>2</sub> groups, one to ten hydroxy groups, one to ten -C(O)OR- groups, one to ten oxygen atoms, one to ten sulfur atoms, one to ten nitrogen atoms, one to ten halogen atoms, one to ten aryl groups, and one to ten saturated or unsaturated heterocyclic rings wherein R<sub>i</sub> is hydrogen or alkyl.

14. A compound of claim 12, wherein the linker moiety is -C(O)-CH<sub>2</sub>-N(H).
15. A compound of claim 13, wherein the linker moiety is -C(O)-CH<sub>2</sub>-N(H).
16. A compound according to claim 1, wherein said compound is a monochloride salt.
17. A compound according to claim 2, wherein said compound is a monochloride salt.
18. A compound according to claim 1, wherein said compound is a dichloride salt.
19. A compound according to claim 2, wherein said compound is a dichloride salt.
20. A method of diagnosing Alzheimer's disease in a human patient which comprises administering to a patient in need of such diagnosis a compound according to claim 1 and measuring the radioactivity arising from the administration of the compound to said patient either by using a gamma camera or by positron emission tomography (PET).
21. A process for production of a compound of formula (I) according to claim 1 comprising:  
reacting a compound of formula (f):



(f)

wherein  $R^1$ ,  $R^2$ ,  $R^3$ , and  $X^1$  are as defined in Claim 1,  
with a compound of formula (b):



(b)

in the presence of a reducing agent.